

OVERVIEW OF BATTERY USAGE IN NASA/GSFC LEO & GEO MISSIONS

Thomas Yi
NASA Goddard Space Flight Center
Greenbelt, Maryland

P-2

An overview of the batteries used in the LEO and GEO missions at Goddard Space Flight Center is described.

In July, 1989, Cosmic Background Explorer (COBE) will be launched from a Delta rocket to study the big bang theory. COBE, which is in a LEO/Polar orbit, will have two 20 Ah NiCd batteries, 18 cells per battery, made by McDonnell Douglas Company. The predicted mission DOD is 0 to 24% over one 63-day eclipse season, the predicted mission temperature, 16° to 22°C, and the specification mission duration, 1 year.

In December, 1989, National Oceanic and Atmospheric Administration (NOAA-D) will be launched from an Atlas rocket for weather observation purposes. NOAA-D, which is in a LEO/Polar morning orbit, will have two 26.5 Ah NiCd batteries, 17 cells per battery, made by GE-Astro East Windsor. The predicted mission DOD is 0 to 16%, the predicted mission temperature, 5°C, and the specification mission duration, 2 years. NOAA-I, which is scheduled for May, 1991 launch in a LEO/Polar afternoon orbit, will have three 26.5 Ah NiCd batteries, 17 cells per battery, made by GE-Astro East Windsor. The predicted mission DOD is 18%, the predicted mission temperature, 5°C, and the specification mission duration, 2 years. NOAA-J is scheduled for July, 1992 launch, and NOAA-K, November, 1993.

In April, 1990, Gamma Ray Observatory (GRO) will be launched from STS37 to study the gamma ray radiation phenomenon. GRO, which is in a LEO orbit, will have two modular power systems (MPS) made by McDonnell Douglas, each MPS consisting of three 50 Ah NiCd batteries, 22 cells per battery. The predicted mission DOD is 15%, the predicted mission temperature, 15°C, and the specification mission duration, 2 years.

In July, 1990, Geostationary Operational Environmental Satellite (GOES-I) will be launched from an Atlas I rocket for weather observation purposes. GOES-I, which is in a GEO orbit, will have two 12 Ah NiCd batteries, 28 cells per battery, made by Ford Aerospace and Communications Company. The predicted mission DOD is 60%, the predicted mission temperature, 7°C, and the specification mission duration, 5 years. GOES-J is scheduled for November, 1991 launch, and GOES-K, for May, 1992 launch.

In December, 1990, Tracking and Data Relay Satellite (TDRS-E) will be launched from STS43 for communication purposes. TDRS-E, which is in a GEO orbit, will have three 40 Ah NiCd batteries, 24 cells per battery, made by TRW. The predicted mission DOD is 50%, the predicted mission temperature, 5°C, and the specification mission duration, 10 years. TDRS-F is scheduled for December, 1992 launch, and TDRS-G for May, 1994 launch.

In August, 1991, Extreme Ultraviolet Explorer (EUVE) will be launched from a Delta rocket. EUVE, which is in a LEO orbit, will have one modular power system (MPS) made by McDonnell Douglas. The predicted mission DOD is 15%, the

predicted mission temperature, 15°C, and the specification mission duration, 3 years.

In December, 1991, Upper Atmosphere Research Satellite (UARS) will be launched from STS50 to study the Earth's ozone layer and other environmental concerns. UARS, which is in a 56° inclination LEO orbit, will have one modular power systems (MPS) made by McDonnell Douglas. The predicted mission DOD is 0 to 24%,

the predicted mission temperature, 10° to 16°C, and the specification mission duration, 3 years.

In addition to these missions, the GSFC has a number of Smaller Explorer missions to be launched from the Scout rockets. The battery requirements for these spacecrafts have not yet been determined.